KOLPIN

SERVICE MANUAL

CONTENTS

Ⅰ	**TECHNICAL INFORMATION**	**1~4**
Ⅱ	**TROUBLE SHOOTING**	**5~9**
Ⅲ	**MAINTENANCE**	**10**
	3-1 MAINTENANCE SCHEDULE	10
	3-2 MAINTENANCE DATA	10
	3-3 FUEL TUBE	11
	3-4 THROTTLE OPERATION	11
	3-5 THROTTLE CABLE ADJUSTMENT	11
	3-6 AIR CLEANER	11
	3-7 SPARK PLUG	12
	3-8 IDLE SPEED	12
	3-9 DRIVE CHAIN	12
	3-10 BRAKE SYSTEM	13
	3-11 WHEELS AND TIRES	14
	3-12 STEERING SYSTEM	14
	3-13 TOE-IN	15
	3-14 GEAR OIL	15
Ⅳ	**ENGINE SYSTEM**	**16**
	4-1 ENGINE REMOVAL AND INSTALLATION	16
	4-2 ENGINE FUEL SYSTEM	17~18
	4-3 ENGINE LUBRICATION AND COOLING SYSTEM	18~20
	4-4 ENGINE COMBUSTION SYSTEM	20~25
	4-5 TANSMISSION SYSTEM	25~31
	4-6 CRANKSHAFT / CRANKCASE	31~35
	4-7 A.C.G ENERATOR	35~36
Ⅴ	**CARBURETOR SYSTEM**	**37**
	5-1 CARBURETOR REMOVAL	37
	5-2 STARTER PLUNGER INSPECTION	38
	5-3 FLOAT CHAMBER DISASSEMBLY	38~39
	5-4 FUEL HEIGHT INSPECTION	39
	5-5 CARBURETOR INSTALLATION	39~40
	5-6 REED VALVE	40
Ⅵ	**FRAME SYSTEM**	**41**
	6-1 FRONT WHEEL AND STEERING SYSTEM	41~50
	6-2 REAR WHEELS	50~54
	6-3 FENDERS AND EXHAUST PIPE	55~57
Ⅶ	**ELECTRICAL SYSTEM**	**58**
	7-1 TROUBLESHOOTING	58
	7-2 BATTERY REMOVAL / INSTALLATION	59
	7-3 A.C.G. INSPECTION	59
	7-4 IGNITION COIL INSPECTION	60
	7-5 START MOROTR	61
	7-6 START RELLEY INSPECTION	61
	7-7 PROJECTOR LIGHT	61

Ⅰ.TECHNICAL INFORMATION

SAFETY

- GASOLINE IS EXTREMELY FLAMMABLE AND IS EXPLOSTIVE UNDER CERTAIN CONDITION.
- NEVER RUN THE ENGINE IN A CLOSED AREA. THE EXHAUST GAS CONTAINS POISONOUS CABRON MONOXIXIDE THAT MAY CAUSE LOSS OF CONSCIONSENESS AND LEAD TO DEATH.
- THE BATTERY ELECTROLYTE CONTAINS SULFURIC ACID. PROTECT YOUR EYES, SKIN AND CLOTHING. IF YOU CONTACT IT, RINSE THOROUGHLY WITH WATER AND CALL A DOCTOR IF ELECTROLYTE GEST IN YOUR EYES.

PREFACE

THE CONTENTS OF THIS MANUAL PROVIDE THE SREVICE INFORMATION FOR UNSION 50/90.

MOST CHAPTERS START WITH A SYSTEM OR ASSEMBLY ILLUSTRATION AND SPECIFICATIONS THE FOLLOWED PAGES GIVE DETAIL PROCEDURES.

IF YOU DO NOT KNOW WHAT THE SOURCE OF THE TROUBLE IS, PLEASE GO THE TROUBLESHOOTIONG FOR ADDITIONAL HELP.

ALL THE CONTENTS OF THIS MANUAL ARE BASED ON THE LATEST MODEL INFORMATION AMS RESERVE THE RIGHT TO MAKE CHANGE AT ANY TIME WITHOUT NOTICE4 AND WITHOUT ANY RESPONSIBILITY OR ENGAGEMENT ON OUR PART.

SPECIFICATION

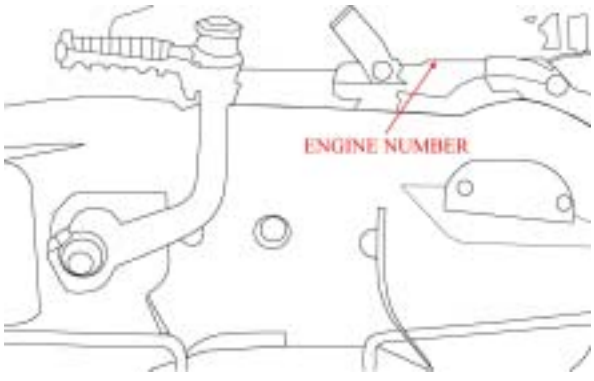
ATV TYPE	DS50	DS90
ENGINE		
Type	2 Stroke Horizontal	2 Stroke Horizontal
Displacement	49cc	82.5cc
Bore and stroke	40×39.2mm	50×42mm
Compression	7.2:1	6.0:1
Carburetion	Mikuni – M1A	Mikuni – M2A
Ignition	C.D.I	C.D.I
Starting	Electric & Kicker	Electric & Kicker
Lubrication	Separated	Separated
Oil tank capacity	1 liter	1 liter
Transmission	Automatic (C.V.T)	Automatic (C.V.T)
CHASSIS		
Overall length	1440mm	1470mm
Overall width	860mm	870mm
Overall high	910mm	950mm
Wheelbase	980mm	980mm
Dry weight	103 kg	110 kg
Fuel tank capacity	5 liter	5 liter
SUSPENSION		
Front	Double wishbone	Double wishbone
Rear	Single damper	Single damper
BRAKES		
Front	Drum	Drum
Rear	Drum / Disk	Drum / Disk
TIRE		
Front	16×8-7	19×7-8
Rear	16×8-7	19×7-8
COLORING	**Red/Yellow/Blue/Green/Black**	**Red/Yellow/Blue/Green/Black**

SERIAL NUMBER

Please record the frame and engine serial numbers for future reference. The frame serial number （1） is stamped on the frame.

FRAME NO._____

The engine serial number（2）is stamped on the left side of the engine crankcase/
ENGINE NO._____



TORQUE VALUES

ENGINE

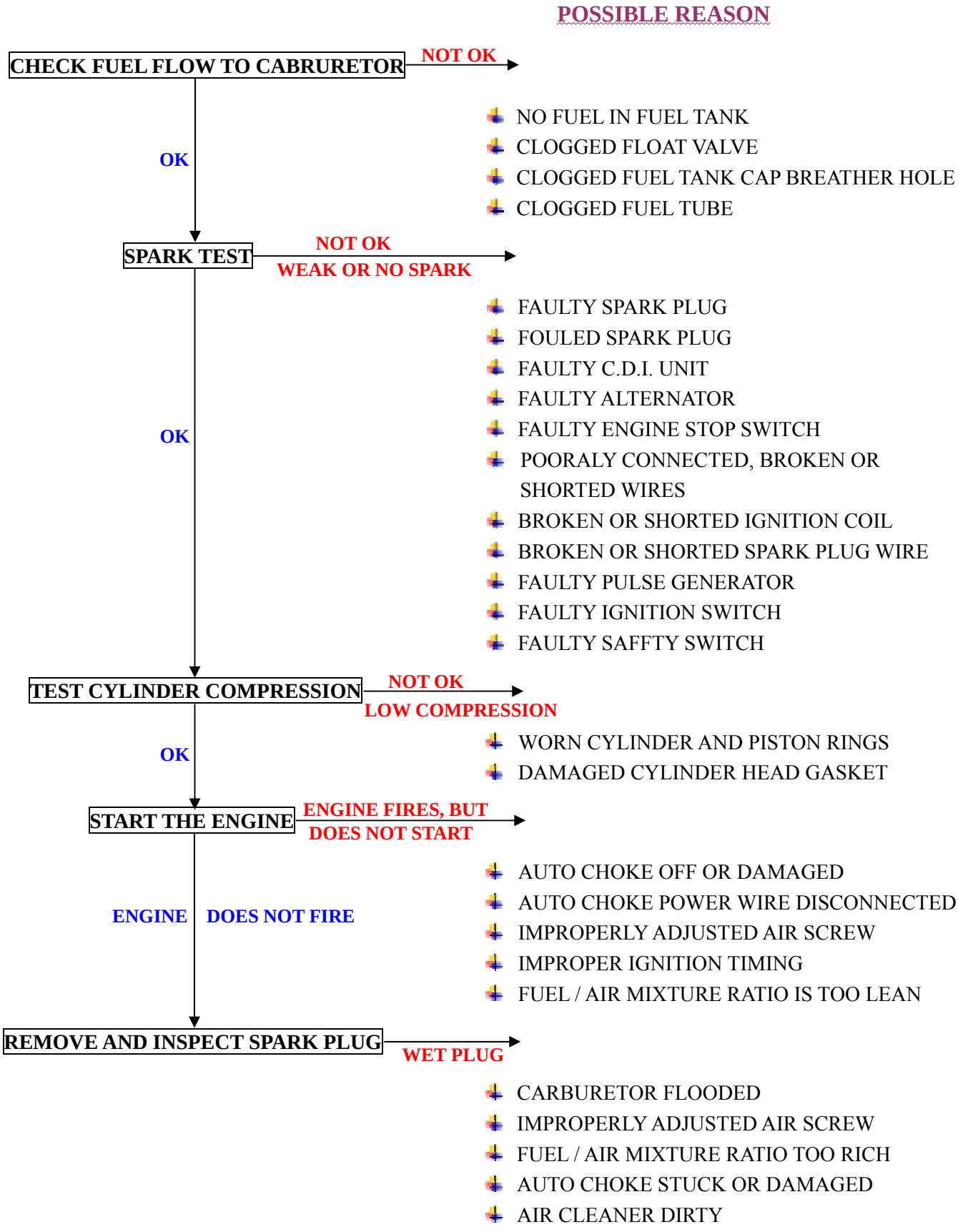
	DS 50 / 90
Cylinder head nut	1.3~1.5kg-m
Spark plug	1.5~2.0 kg-m
Cylinder head bolt	1.4~2.0 kg-m
Alternator bolt	3.5~4.0 kg-m

FRAME

	DS 50 / 90
Handlebar upper holder bolt	2.0~2.2 kgf-m
Steering shaft nut	4.5~5.0 kgf-m
Steering shaft bushing holder nut	2.0~2.2 kgf-m
Wheel rim bolt	3.5~4.0 kgf-m
Tie rod lock nut	3.0~3.5 kgf-m
Knuckle nut	3.5~4.0 kgf-m
Handlebar lower holder nut	4.5~5.0 kgf-m
Front wheel bolt	3.5~4.0 kgf-m
Front axle nut	4.0~4.5 kgf-m
Rear axle nut	4.5~5.0 kgf-m
Rear wheel bolt	3.5~4.0 kgf-m
Exhaust muffler mounting bolt	0.7~1.0 kgf-m
Engine hanger bolt	2.0~2.3 kgf-m
Drive sprocket 19T	4.5~5.0 kgf-m

Ⅱ.TROUBLESHOOTING

ENGINE DOES NOT START



POOR PERFORMANCE AT LOW AND IDLE SPEEDS

POSSIBLE REASON

CHECK IGNITION TIMING — **NOT OK** →

- FAULTY C.D.I.

OK ↓

CHECK CABRURETOR AIR SCREW ADJUSTMENT — **NOT OK** →

- MIXTVRE TOO LEAN
- MIXTURE TOO RICH

OK ↓

CHECK FOR LEAKING INTAKE PIPE — **NOT OK** →

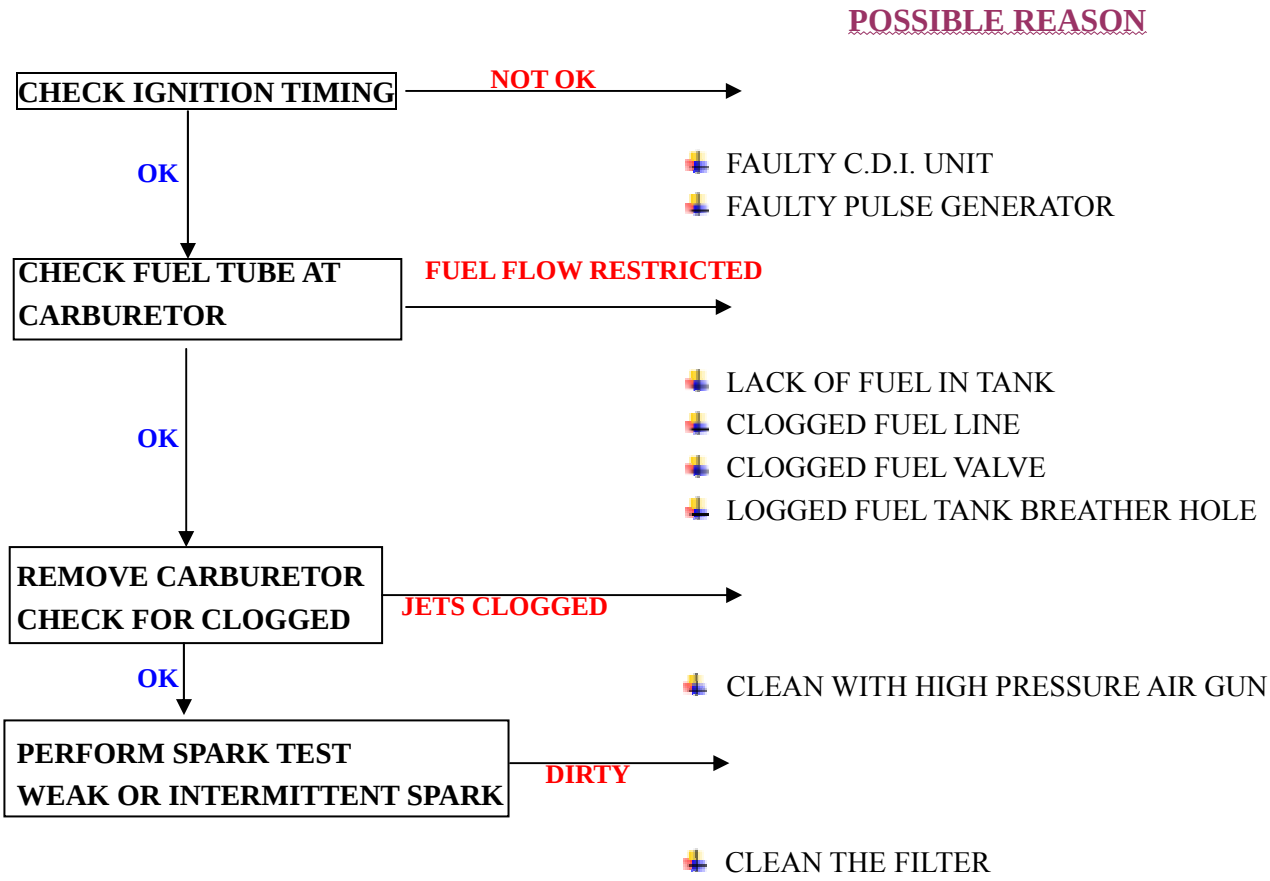
- DETERIORATED INSULATOR O-RING
- LOOSE CARBURETOR

OK ↓

PERFORM SPARK TEST WEAK OR INTERMITTENT SPARK →

- LOOSE OR DISCONNECTED IGNITION SYSTEM WIRES
- FAULTY, CARBON OR WET FOULED SPARK PLUG
- FAULTY ALTERNATOR
- FAULTY C.D.I. UNIT
- FAULTY IGNITION SWITCH
- FAULTY IGNITION COIL
- FAULTY PULSE GENERATOR
- BROKEN OR SHORTED SPARK PLUG WIRE
- FAULTY ENGINE STOP SWITCH

POOR PERFORMANCE AT LOW AND IDLE SPEEDS



POOR PERFORMANCE AT LOW AND IDLE SPEEDS

POSSIBLE REASON

RAISE WHEELS OFF GROUND AND SPIN BY HEND — **DOESNOT SPINEREELY**

- BRAKE DRAGGING
- DRIVE CHAIN TOO TIGHT
- DAMAGED WHEEL BEARING
- WHEEL BEARING NEEDS LUBRICATION

SPIN FREELY

CHECK TIRE PRESSURE — **PRESSURE LOW**

- PUNCTURED TIRE
- FAULTY TIRE VALVE

PRESSURE NORMAL

ACCELERATE SLOWLY — **ENGINE SPEED DOES NOT INCREASE**

- FUEL/AIR MIXTURE RATIO TOO RICH OR LEAN
- CLOGGED IN AIR CLEANER
- CLOGGED IN MUFFLER
- RESTRICTED FUEL FLOW
- CLOGGED FUEL TANK CAP BREATHER HOLE

ENGINE SPEED INCREASES

CHECK IGNITION TIMING — **NOT OK**

- FAULTY PULSE GENERATOR
- FULTY C.D.I UNIT

OK

TEST CYLINDER COMPRESSION — **TOO LOW**

- LEAKING HEAD GASKET
- WORN DYLINDER AND PISTON RINGS

OK

CHECK CARBURETOR — **CLOGGE**

- CLEAN

OK

CHECK SPARK PLUG — **FOULED OR DISCOLORED**

- CLEAN THE SPARK PLUG
- SPARK PLUG IS INCORRECT HEAT RANGE

OK

CHECK FOR ENGINE OVERHEATING — **OVERHEATING**

- EXCESSIVE CARVON DEPOSIVED IN COMBUSTION CHAMBER
- WRONG TYPE OF FUEL
- FUEL/AIR MISTURE RATIO IS LEAN
- USE OF POOR QUALITY FUEL

OK

ACCELERATE OR RUN AT HIGH SPEED — **KNOCKS**

- WORN PISTON AND CYLINDER
- FUEL/AIR MIXTURE RATIO IS LEAN
- WRONG TYPE OF FUEL
- IGNITION TIMING TOO ADVANCED
- EXCESSIVE CARBON DEPOSITED IN COMBUSTION CHAMBER

P00R HANDL I NG

POSSIBLE REASON

STEERUBG US GEAVT →

- DAMAGED STEERING BEARING
- DAMAGED STEERING SHAFT BUSHING

ONE WHEEL IS WOBBLING →

- BENT RIM
- IMPROPERLY INSTALLED WHEEL HUB
- EXCESSIVE WHEEL BEARING PLAY
- BENT SWINGARM
- BENT FRAME
- SWINGARM BUSHING EXCESSIVELY WORN

VEHICLE PULLS TO ONE SIDE →

- BENT TIE-ROD
- INCORRECT TIE-ROD ADJUSTMENT
- REAR TIE AIR PRESSURE INCORRECT
- IMPROPER WHEEL ALIGNMENT
- BENT FRAME

Ⅲ.MAINTENANCE

3.1 MAINTENANCE SCHEDULE

The maintenance intervals in the table below is based upon average riding and conditions. Riding in unusually dusty areas, require more frequent servicing

C: Clean　L: Lubricate　R: Replace　I: Inspect and Clean, Adjust, Lubricate or Replace, if necessary

	INITIAL SERVICE (First week)	REGULAR SERVICE (Every 30 operating days)	EVERY YEAR
FUEL LINE			I
THUOTTLE OPERATION	I	I	
AIR CLEANER		C	
SPARK PLUG		I	
CARBURETOR IDLE SPEED	I	I	
DRIVE CHAIN	L,I	L,I	
BRAKE SHOE WEAR			I
BRAKE SYSTEM	I	I	
NUT, BOLT, FASTENER	I	I	
WHEEL	I	I	
STEERING SYSTEM			I
SUSPENSION SYSTEM			I
C.V.T. AIR FILTER		C	
GEAR OIL			R

3.2 MAINTENANCE DATA

SPECIFICATION

	DS 50 / 90
SPARK PLUG GAP	0.7-0.8mm
RECOMMENDED SPARK PLUGS	NGK BPR8HS
THROTTLE LEVER FREE PLAY	5-10mm
IDLE SPEED	1800±100rpm
BRAKE LEVER FREE PLAY	15-20mm
DRIVE CHAIN SLACK	10-20mm
FRONT / REAR TIRE PRESSURE	2-10 psi（0.15-0.7bar）
TOE-IN	0-10mm
ENGINE OIL	SAE10W-40
GEAR LUBRICATION OIL	SEA90
BATTERY	12V-5AM

3.3 FUEL TUBE

Inspect the fuel lines for deterioration, damage or leakage and replace if necessary.

3.4 THROTTLE OPERATION

Inspect for smooth throttle lever full opening and automatic full closing in all steering positions.
Inspect if there is no deterioration, damage or kicking in the throttle cable, replace it if necessary.
Check the throttle lever, free play is 5-10mm at the tip of the throttle lever.
Disconnect the throttle cable at the upper end.
Lubricate the cable to prevent premature wear.

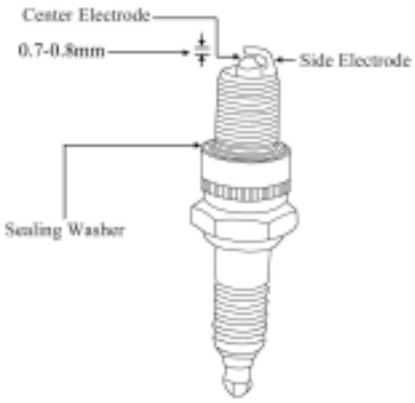
3.5 THROTTLE CABLE ADJUSTMENT

Slide the rubber cap of the adjuster off the throttle Housing, loosen the lock nut and adjust the free play of the throttle lever by turning the adjuster on the throttle housing. Inspect the free play of the throttle lever.

3.6 AIR CLEANER

Unscrew the air cleaner cover screws.
Pull out the air filter element from the air cleaner case.
Wash the element in non-flammable solvent, squeeze out the solvent thoroughly. Let it dry.
Soak the filter element in air filter oil and then squeeze out the excess oil.
Install the element into air cleaner carefully.

3.7 SPARK PLUG

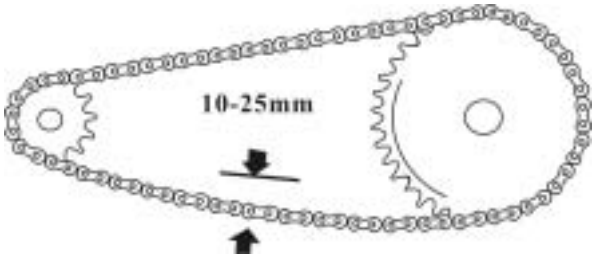


The spark plug located at the front of the engine.
Disconnect the spark plug cap and unscrew the spark plug.
Check the spark plug electrodes for wear out.
Install a new spark plug if the electrodes and insulator tip appear unusually fouled or burned.
The spark plug gap must be 0.7-0.8mm.
With the sealing washer attached, apply cupper grease, and thread the spark plug in by hand to prevent cross threading.
Tighten the spark plug with 1.5-2kg-m

3.8 IDLE SPEED

Connect a engine speed meter.
Warm up the engine, 10 minutes are enough.
Turn the idle-speed adjust screw on the carburetor to obtain the idle speed. “Turn in” (clockwise) will get higher speed. “Turn out” (counter clockwise) will result in lower speed.
IDLE SPEED:1800±100rpm

3.9 DRIVE CHAIN



Inspect the chain slack. The standard is 10-25mm.

Adjust the chain slack. (in the rear fork)
Loose the lock bolts (4 PCS) then adjust the drive chain slack by turning the adjustment nut.
Tighten the our lock bolts.
Apply chain lubricant to lubricate the drive chain.

When the drive chain is very dirty, it should be removed, cleaned and lubricated with chain specific grease.
Clean the drive chain with kerosene and wipe it dry, and apply the lubricant.
Inspect the drive chain for possible wear or damage.
Replace the chain, if it is worn excessively or damaged.

Inspect the drive sprocket (19T), if the teeth are worn or damaged, replace it.

Inspect the rubber sleeve.
It the rubber sleeve are worn or damaged, replace it.

3.10 BRAKE SYSTEM

Inspect the front brake lever and cable for excessive free play or damage.
Replace or repair if necessary.
Measure the free play of the brake cable at the end of the brake lever. The standard free play is 15-25mm.

Inspect the rear brake lever and cable for excessive free play or damage.
Replace or repair if necessary.
Measure the free play of the rear brake cable at the end of the lever, The standard free play is 15-25mm.

Adjust the free play of the rear brake lever by turning the adjuster on the rear axle.

3.11 WHEELS AND TIRES

Inspect the tire surfaces for cuts, nails or other sharp objects.
Check the pressure at cold tire condition.
The standard of tire pressure is
DS50 : 3-6 psi
DS90 : 3-6 psi

3.12 STEERING SYSTEM

Check the free play of the steering shaft with the front wheels, steering straight ahead.
When there is excessive play, inspect the tie-rod, knuckle bushing and ball joint.

3.13 TOE-IN

Park the vehicle on level ground and the front wheels facing straight ahead.
Mark the centers of the tires to indicate the axle center height.
Measure the distance between the marks.

Carefully move the vehicle back, let the wheels have turned 180°, so the marks on the tires are aligned with the axle center height.
Measure the distance between the marks.
Calculate the difference in the front and rear measurements.
Toe-in : 0-10mm.

If the toe-in is out of standard, adjust it by changing the length of the tie-rods equally by turning the tie-rod while holding the ball joint.
Tighten the lock nuts.
(A) Toque : 3.0-3.5kgf-m

3.14 GEAR OIL

Gear oil needs to be changed every year.
There is gear oil release bolt at the rear of engine.
Unscrew this release bolt and can let the dirty oil flow out.
The re-add oil hole is on the engine case besides the gear box.

Ⅳ.ENGINE SYSTEM

4.1 MAINTENANCE SCHEDULE

4-1-1 ENGINE SHALL BE REMOVED IN THE CONDITIONS OF NECESSARY REPAIRMENT OR ADJUSTMENT TO THE TRANSMISSION AND COMBUSTION SYSTEM ONLY.

4-1-2 ENGINE REMOVAL

Remove the seat and all cover fender.
Remove the spark plug cap from the spark plug.
Remove the exhaust pipe.
Disconnect the carburetor.
Take off the oil pump cable from the oil pump control plate.
The oil pump is on the right side of the engine.

Discontent the wire connectors.
There are three connectors:
carburetor auto-choke
starter motor
generator
Remove the drive chain cover.
Remove the drive chain retaining clip and master link, and remove the drive chain.

Remove the three engine mounting nuts and bolts.
Remove the engine from the right side of frame.

4-1-3 ENIGNE INSTAKLLATION

Engine installation is essentially the reverse order of removal.
The torque of the engine mounting bolts is 4.5-5.0kg-m
Route the wires and cable in reverse order properly.

4.2 ENGINE FUEL SYSTEM

4-2-1 TROUBLESHOOTING

ENGINE DOES NOT STARTIN

- NO FUEL IN TANK
- NO FUEL TO CYLINDER
- TOO MUCH FUEL GO IN TO CYLINDER
- NO SPARK AT PLUG
- AIR CLEANER CLOGGED

ENG AIDLESS UNSTEADY, STALLS OR RUNS POORLY

- IN PROPER ADJUSTMENT OF THE LD LE SPEED SCREW
- IGNITION MALFUNCTION
- FUEL / AIR MIX TRUE RATIO INCORRECT
- AIR FILTER DIRTY
- IN SULTAN OR LEAKS
- FUEL TANK CAP BREATHING HOLE CLOGGED
- FUEL JET OF CARBURETOR CLOGGED

LEAN MIXTURE

- FUEL JET OF CARBURETOR CLOGGED
- FUEL TANK CAP BREATHING HOLT CLOGGED
- FUEL FILTER CLOGGED
- FUEL FLOW IN THE TUBE UNSMOOTH
- FLOAT LEVEL IN CARBURETOR TOO LOW

RICH MIXTURE

- FLOAT NEEDLE VEAL VEIN CARBURETOR FAULTY
- FLOAT LEVEL TOO HIGH
- AIR DUCT IN CARBURETOR IS CLOGGED
- AIR FILTER DIRTY

4-2-2 FUEL TANK

REMOVAL

Remove the seat and front / rear, side cover and handle bar assy.

Disconnect the fuel line from the carburetor.

Remove the fuel tank cap and front fender.

Unscrew the fuel tank fixed bolts.

Note : Keep gasoline away from flames or sparks.

Wipe up spilled gasoline at once.

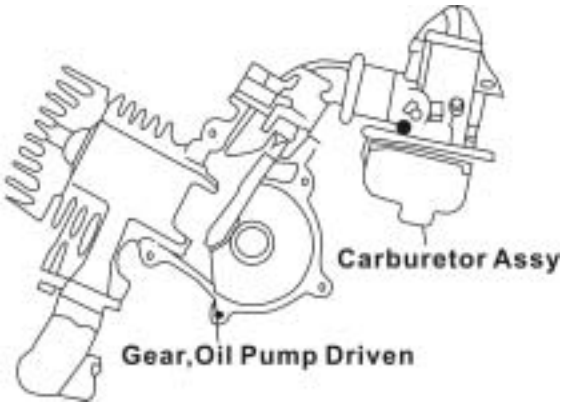
4-3 ENGINE LUBRICATION AND COOLING SYSTEM

4-3-1 ENGINE LUBRICATION AND COOLING SYSTEM

The pump gears of the oil pump are driven by the engine crankshaft. The pump gears rotate the plunger shaft in the oil pump.

This shaft forwards the lubricating oil into the crankcase to mix with the air-fuel mixture flow evenly.

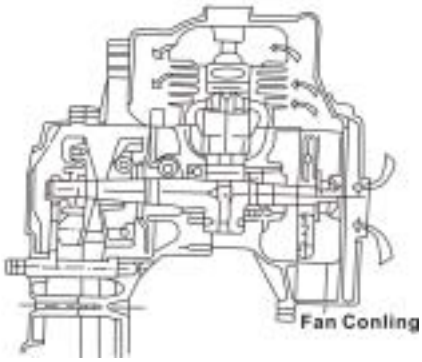
The oiled mixture lubricates the cylinder inner wall, piston surface and piston rings.



4-3-2 COOLING SYSTEM

The cooling fan is on the right side of the engine.

Cool air is forced to flow through cylinder fins and cylinder head. In this way the cylinder and piston will not overheat.



4-3-3 OIL PUMP REMOVAL

Remove the front fender rod (L), fan cover assy, cooling fan, generator.

Disconnect the oil tube of oil pump (intake & output.)

Remove the oil pump control cable.

Remove the setting bolt of oil pump.

Remove the oil pump.

4-3-4 OIL PUMP INSPECTION

Check the O-ring, gear & seal for wear or any damage.

NOTE: Do not disassembly the oil pump body to prevent and damage.

4-3-5 OIL PUMP INSTALLATION

Coating some oil on the O-ring.

Install the oil pump onto the crankcase.

Connect the oil tube.

Connect the oil pump control cable and adjust the clearance.

4-3-6 RELEASE THE AIR OF OIL PUMP

Loosen the drain screw.

Let the oil drain out in smoothly then tight the screw.

NOTE: If the oil can not drain out in smoothly, it is mean some air still in the oil pump.

4-3-7 TROUBLESHOOTING

LACKING OIL SUPPLY TO ENGINE

- **THE OIL LEVEL IN OIL TANK IS TOO LOW**
- **OIL TUBES WERE NOT FIXED WELL**
- **OIL HAS LEAKED FROM TUBE ENDS**
- **OIL TUBES WERE BROKEN**
- **OIL TUBES WERE CLOGGED**
- **OIL PUMP DOES NOT FUNCTION**

ALWAYS INSUFFICIENT OIL LEVEL IN OIL TANK

- **EXTERNAL OIL LEAKS**
- **WORN CYLINDER HEAD GASKET**
- **WORN PISTON RINGS**

4-4 ENGINE COMBUSTION SYSTEM

4-4-1 TROUBLESHOOTING

LOW COMPRESSION

- **CYLINDER HEAD**

  HEAD GASKET LEANING OR DAMAGED WARPED OR CRACKED SYLINDER HEAD
- **CYLINDER OR PISTON RINGS WORN OUT**

HIGH COMPRESSION

- **EXCESSIVE CARBON BUILD-UP ON PISTON HEAD OR IN COMBUSTION CHAMBER**

EXCESSIVE NOISE

- **PISTON AND CYLINDER WORN OUT**
- **EXCESSIVE CARBON BUILD0UP**

EXCESS SMOKE

- **CYLINDER OR PISTON PINGS WORN OUT**
- **IMPROPER INSTALLATION OF PISTON PINGS**
- **PISTON OR CYLINDER WALL SCORED OR SCRATCHED**

OVER HEATING

- **EXCESSIVE CARBON BUILD-UP ON THE PISTON OR COMBUSTION CHAMBER**
- **FAULTY ENGINE COOLING SYSTEM (FAN, CYLINDER COVER……)**
- **OIL SUPPLY IS OUT OF ORDER**
- **WRONG IGNITION TIMING**

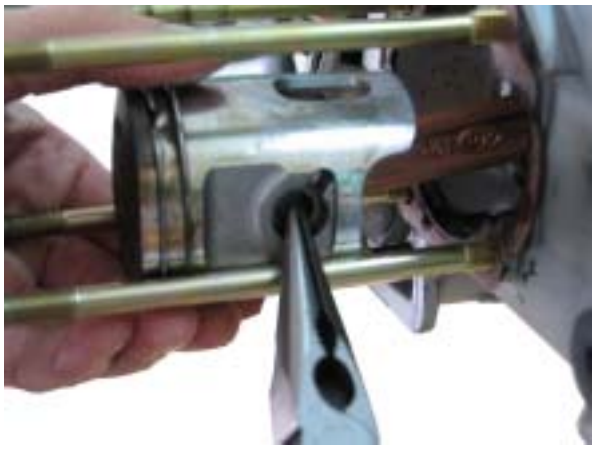
4-4-2 CYLINDER HEAD REMOVAL

Remove the seat and all the cover.
Remove the exhaust pipe.
Remove the spark plug cap.
Disconnect the wire.
Remove the engine out of the chassis.
Disassemble the air cleaner and carburetor.

Remove the spark plug.
Remove the setting bolts of cylinder head.
Remove the cylinder head.

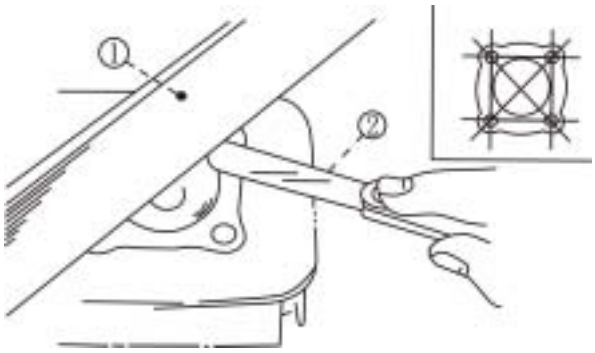
CYLINDER REMOVAL
Remove the cylinder head.
Remove the cylinder.
Remove the cylinder gasket.
NOTE: Clean all the material of cylinder gasket with a scraper.

PISTON REMOVAL
Remove the piston pin clip.
NOTE: Do not let the clip fall into the crankcase.
Remove the piston pin.
Remove the piston.



4-4-3 CYLINDER HEAD INSPECTION

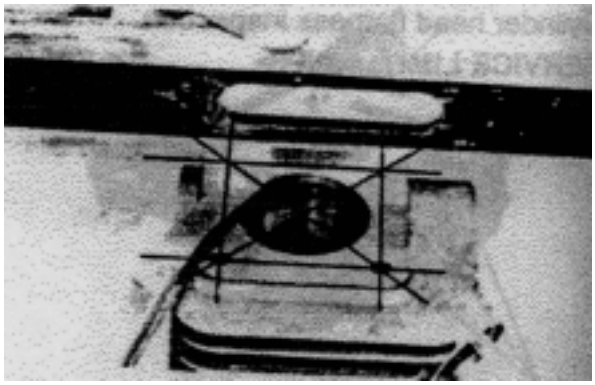
Cylinder head flatness inspection.
SERVICE LIMIT: 0.03mm



4-4-4 CYLINDER INSPECTION

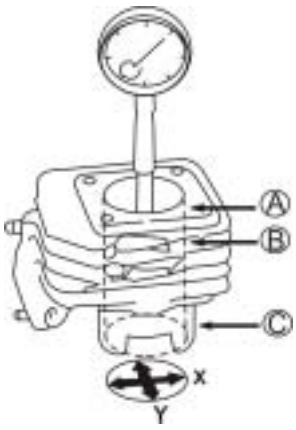
Inspect the cylinder bore for wear or damage.
Measure the cylinder I.D. at three places; top, middle and bottom of piston travel and in to directions art right angle to each other.
SERVICE LIMITS: 40.5mm

Cylinder block flatness inspections:
SERVICE LIMITS: 0.03mm



Calculate the piston-to-cylinder clearance.
SERVICE LIMITS: 0.1mm

Calculate the taper and out of round.
SERVICE LIMITS:
Out of round: 0.004mm



4-4-5 PISTON / PSITON RING INSPECTION

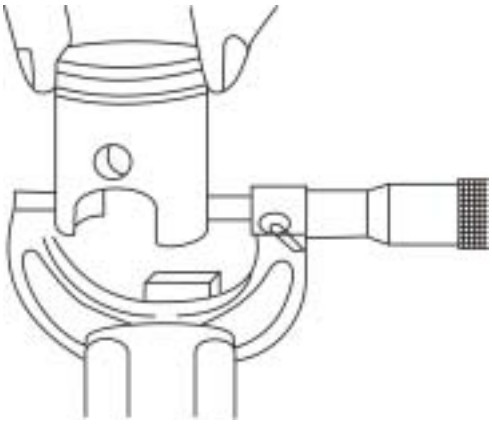
Remove the piston rings

Clean the grooves for carbon deposit completely.

NOTE: Do not damage the piston ring during removal.

Measure piston pin bore O.D, at a point 10mm from the bottom.

SERVICE LIMITS: 39.95-3.97mm



Measure piston pin bore I.D. in two directions at right angle to each other.

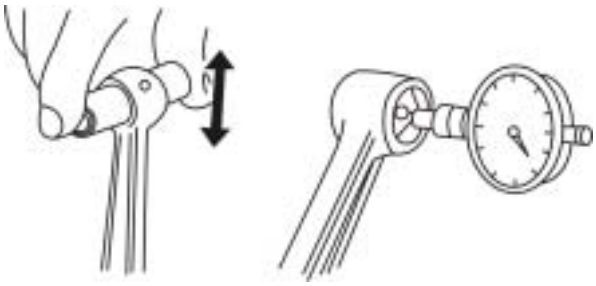
SERVICE LIMITS: 9.95-10mm

Measure the piston pin O.D. at the front, center and rear and in to directions across from each other.

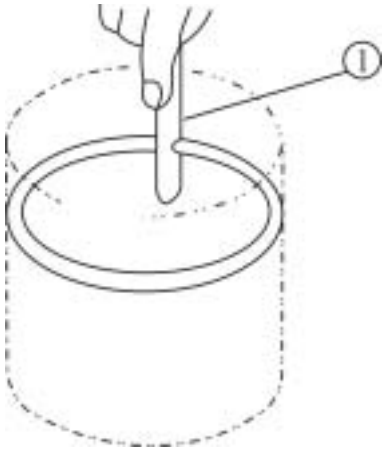
SERVICE LIMIT: 9.9mm

Connecting rod small end inspections:

SERVICE LIMIT: 14.05mm



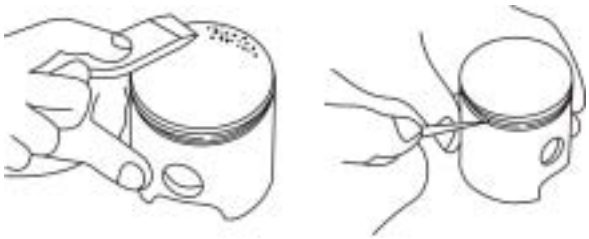
Insert each piston ring into cylinder with the piston and measure the ring end gap in the cylinder to point 10mm (0.04 in) from the bottom.



PISTON RING INSTALLATION

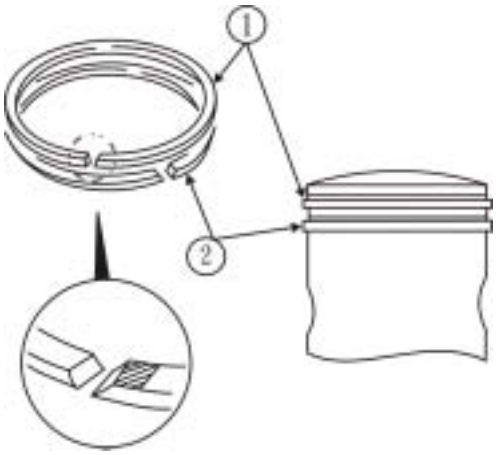
Clean the piston ring grooves thoroughly.

Install the piston ring.



NOTE:

- Avoid piston and piston ring damage during installation.
- All ring should be installed with the mark facing up.



4-4-6 PISTON INSTALLATION

Install the piston, piston pin and new piston pin clips.

NOTE:

- Piston the “EX” mark on the exhaust side.
- Do not let the piston pin clip fall into the crankcase.

4-4-7 CYLINDER / CYLINDER HEAD

Install the cylinder gasket.
Coat the cylinder and piston ring with the engine oi.
Install the cylinder.
Install the cylinder head
Tighten the cylinder mounting bolts
The torque is 1.4-2.0kg-m

4-4-8 ENGINE INSTALLATION

The installation sequence is essentially the reverse of removal.
NOTE: Route all the wire and cable properly.
Adjust the throttle cable free play.
Adjust the oil pump control cable clearance.

4-5 TANSMISSION SYSTEM

4-5-1 LEFT CRANKCASE COVER REMOVAL

Remove the crankcase cover.
Remove the dowel pin.

Remove the kick pinion with the kick friction spring.
Disconnect the kick start spring.

Remove the cir-clip & plate washer.
Remove the kick spindle bush.
Remove the spindle & the pring.

Remove the O-ring.
Remove the setting nut of clutch outer.

Remove the clutch outer & driven pulley.
Remove the drive belt.

Remove the setting nut of driver face.

Remove the conical spring washer & the one way clutch.
Remove the claw washer, driver face & plat washer.

Remove the movable drive face & collar.

4-5-2 START CLUTCH REMOVAL

Remove the starter clutch & starter wheel.
Remove the gear boss.
Remove the plat washer.

Remove the idle gear plate.
Remove the idle gear.

4-5-3 DRIVEN BELT INSPECTION

Inspect the belt for crack wear or any damage measure the width of belt.
SERVICE LIMIT: 14.6mm

4-5-4 WEIGHT ROLLER INSPECTION

Measure the weight roller O.D.
SERVICE LIMIT: 14.5mm

4-5-5 MOVABLE DRIVEN FACE INSPECTION

Measure the movable driven face I.D.
SERVICE LIMIT: 18.10mm

4-5-6 BOSS OF DRIVEN FACE INSPECTION

Measure the boss I.D.
SERVICE LIMIT: 17.90mm

4-5-7 CLUTCH OUTER INSPECTION

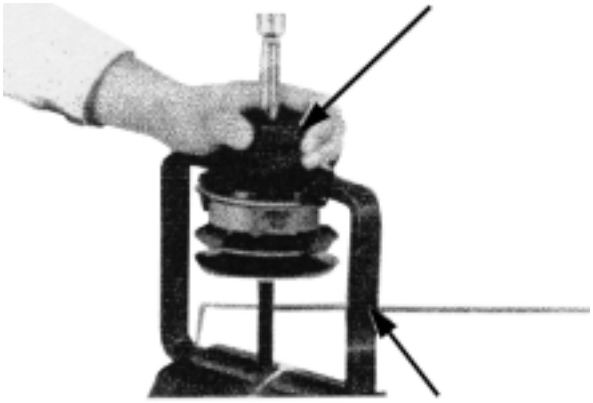
Measure clutch outer I.D.
SERVICE LIMIT: 112mm

4-5-8 CLUTCH LINING INSPECTION

Measure the lining thickness.
SERVIE LIMIT: 1mm

4-5-9 DRVIEN PULLEY DISASSEMBLY

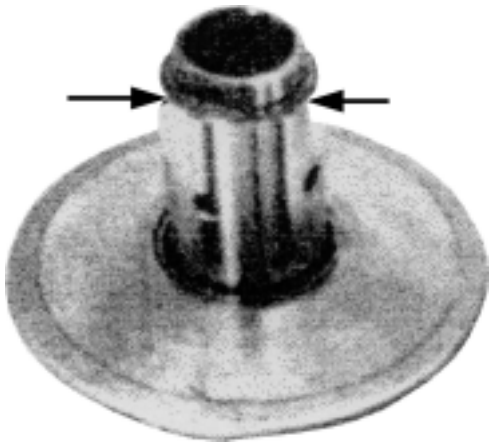
Fix the driven pulley in a compressor.
Remove the special nut.
Release the compressor.
Remove the driven plat assy.



4-5-10 DRIVEN FACE SPRING INSPECTION

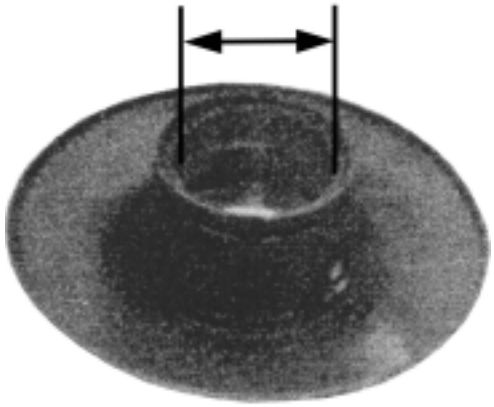
Measure the spring free leant.

DRIVEN FACE INSPECTION
Measure the drive face O.D.
SERVICE LIMIT: 32.94mm



4-5-11 MOVABLE DRIVEN FACE

INSPECTION
Measure the movable driven face I.D.
SERVICE LIMIT: 33.06mm



4-5-12 FINAL TRANSMISSION GEAR REMOVAL

Drain the gear oil
Remove the mission cover.

Remove mission cover gasket & dowel pin.
Remove final shaft & final gear.
Remove counter shaft.

4-5-13 FINAL GEAR TRANSMISSION GEAR INSPECTION

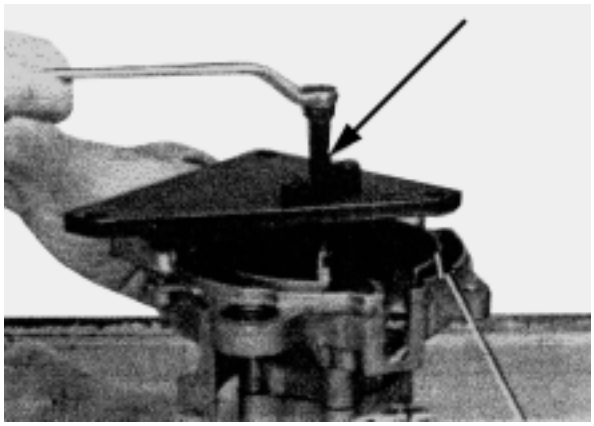
Inspect the gears & shafts for wear or damage.

4-6 CRANKSHAFT / CRANKCASE

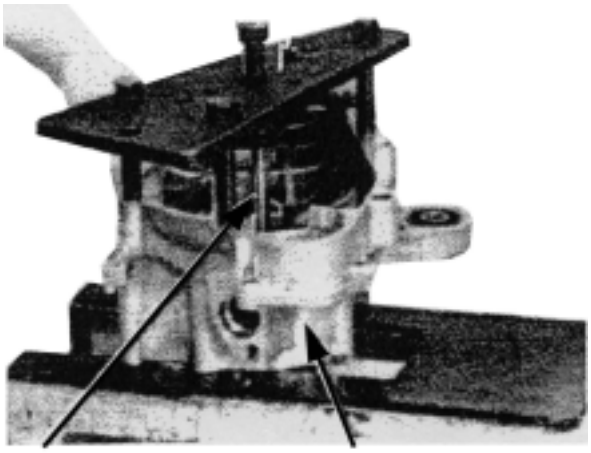
4-6-1 CRANKCASE REMOVAL

Remove the crankcase setting bolts.

Remove the right crankcase from the left crankcase by using a pulley.



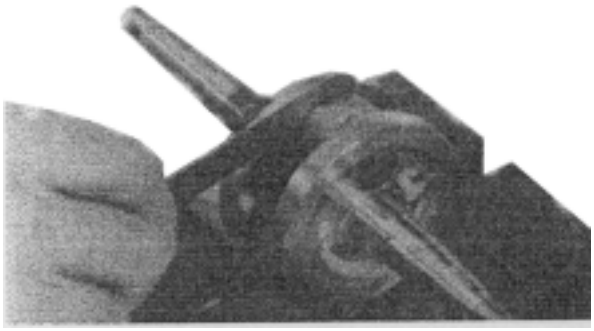
Remove the crankcase from the left crankcase by using a pulley.



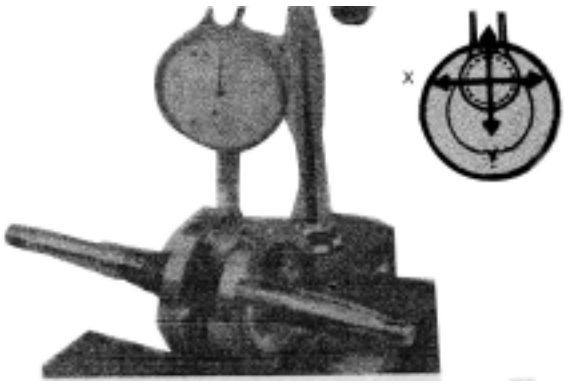
Remove the bearing of crankcase by using a bearing pulley.

4-6-2 CRANKSEHAFT INSPECTION

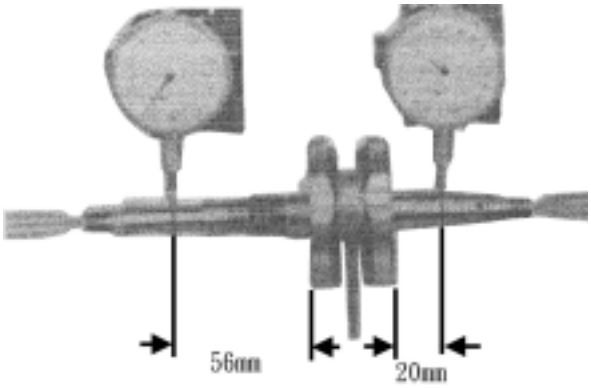
Measure the connection rod big end side clearance with a feeler gauge.
SERVICE LIMIT: 0.2-0.5mm



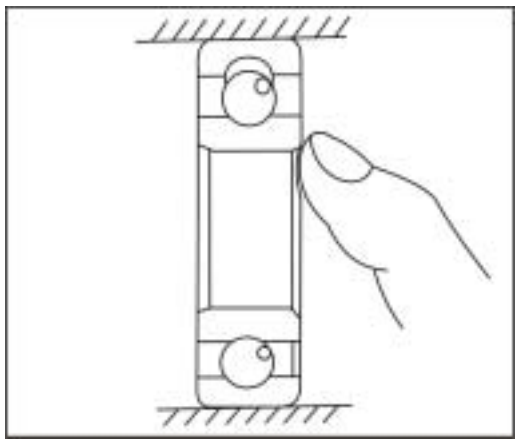
Measure the connecting rod big end radial clearance at two different point across from each other.
SERVICE LIMIT: 0.4-0.8mm



Place the crankshaft on a stand or V-blocks and measure the run out using a dial gauge.
Actual bend is 1/2 of total indicator reading.
SERVICE LIMIT:0.03mm

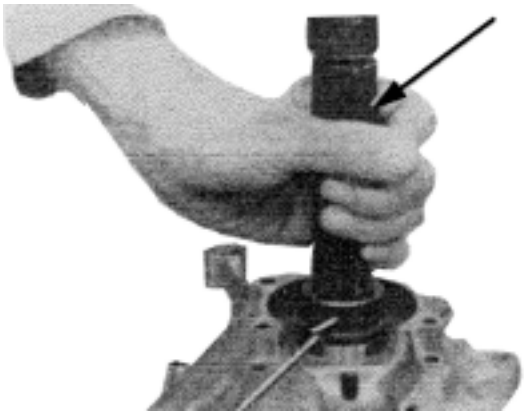


Check the crankshaft bearing play.
If they are noisy or have recessive play, replace a new one.

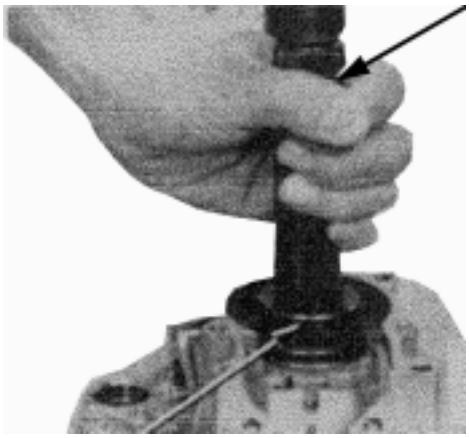


4-6-3 CRANKCASE INSTALLATION

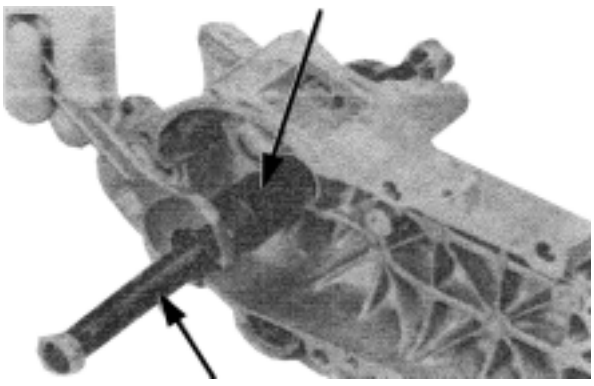
Install the crankshaft bearing into the left crankcase.



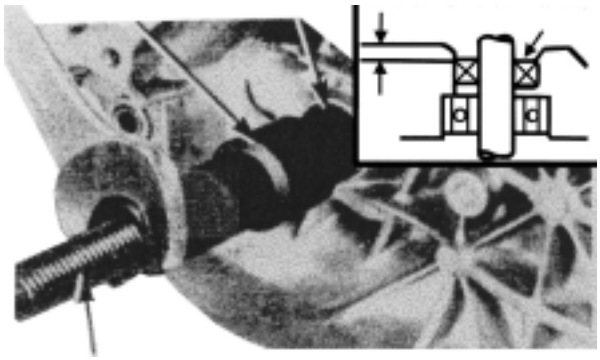
Install the crankshaft bearing into the right crankcase.



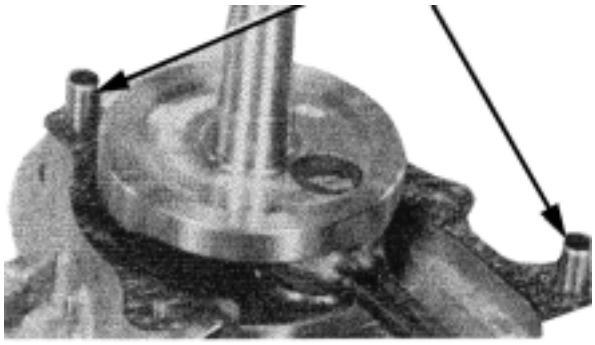
Install the crankshaft into the left crankcase.



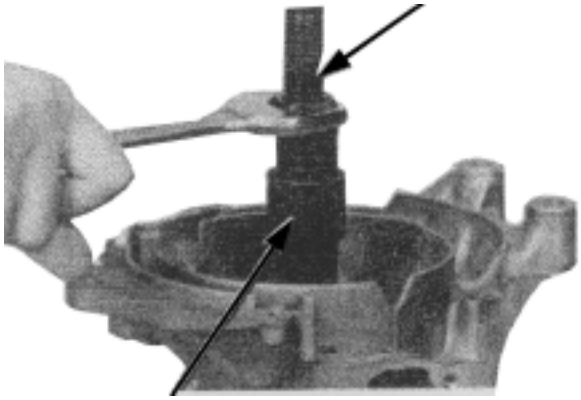
Install the oil seal into the left crankcase.



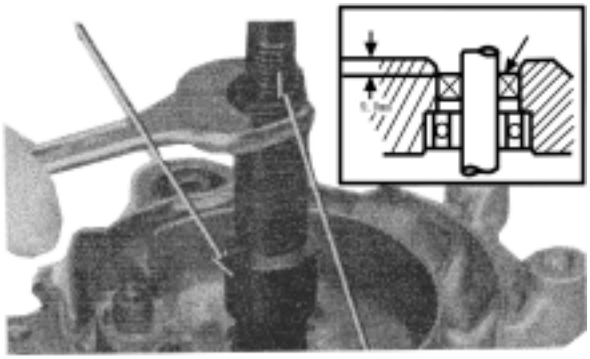
Install the dowel pins.



Install the right crankcase.



Install the oil seal into the right crankcase.



Install the setting bolts of crankcase.
TORQUE: 0.7-1.0kg-m

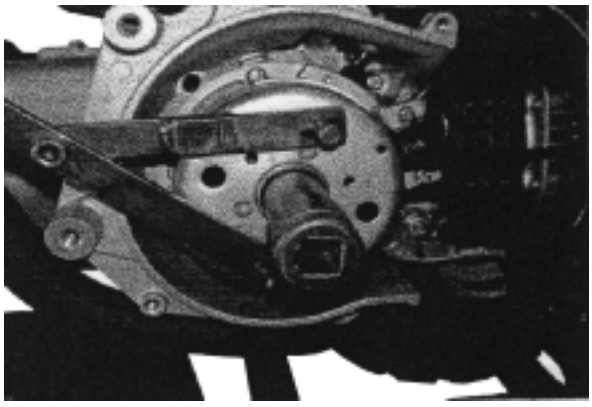
4-7 A.C.G. ENERATOR

4-7-1 A.C.G. ENERATOR REMOVAL

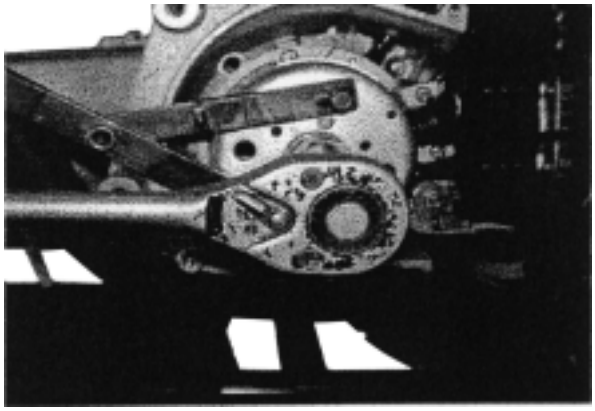
Remove front fender (L) and fan cover assy.

Remove the cooling fan setting bolts.
Remove the cooling fan.

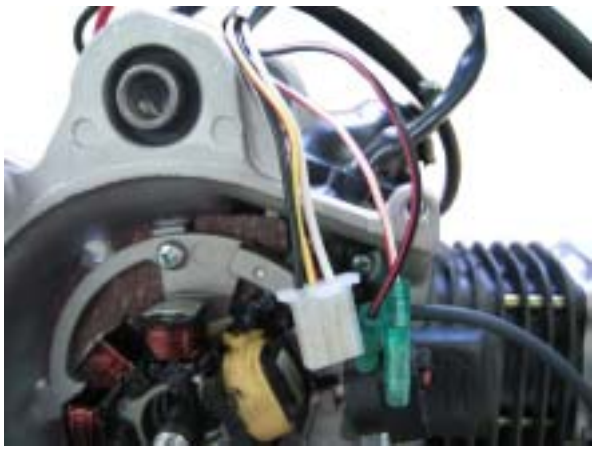
Remove the fly wheel setting nut by using a "Y" fixer.



Remove the fly wheel by using a puller.



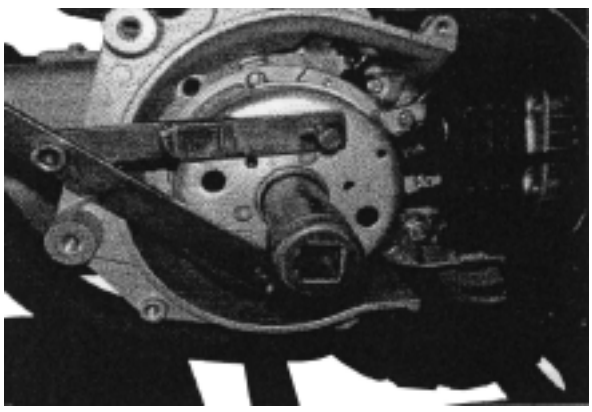
Disconnect the wires of A.C.G.



Remove the A.C.G. setting bolts.
Remove the A.C.G.

4-7-2 A.C.G. INSTALLATION

the installation sequence is essentially the reverse of removal.



Ⅴ.CARBURETOR SYSTEM

Kolpin ATV Carburetion Specifications

50cc Jetting Chart

	SEA LEVEL STOCK	ALTITUDE 4-7000	HIGH ALTITUDE 7000 +
Pilot	17.5	17.5	17.5
Air Screw	¾ to 1 ¼ turns	1 to 1 ½ turns	1 ½ to 2 turns
Needle	#4	#2	#1 (full lean)
Main	77.5	70	65

90cc Jetting Chart

	SEA LEVEL STOCK	ALTITUDE 4-7000	HIGH ALTITUDE 7000 +
Pilot	12.5	12.5	12.5
Air Screw	1 to 1 ¼ turns	1 to 2 turns	1 to 2 turns
Needle	#4	#3	#2 or #1 (full lean)
Main	82.5	75	70

Main Jet: The round, slotted brass jet located in the center of the carburetor after removing the float bowl. It controls fuel from ½ to wide open throttle.

Pilot Jet: The very small slotted jet located in the cast tube next to the main jet. It controls idle up to ¼ throttle opening.

Needle: Located inside the throttle slide and protrudes into the carburetor. It is held in one of five positions by a circlip. It controls mid-throttle fuel requirements. The top groove of the needle is the #1 position and is the leanest position. The bottom groove of the needle is the #5 position and full rich.

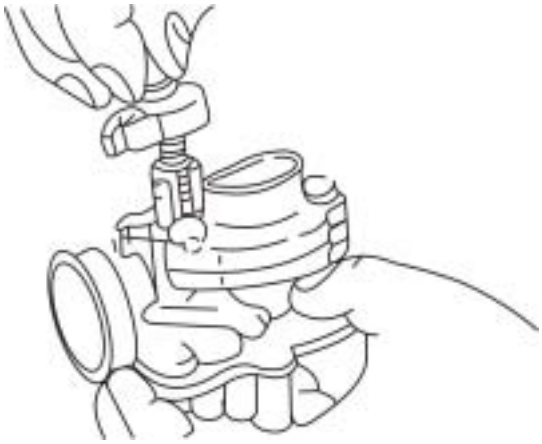
Pilot Air Screw: Controls the amount of air that mixes with the pilot jet. Turning the screw in makes the mixture richer; turning out makes the mixture leaner. It is located on the air intake side of the carburetor near where the airbox boot is clamped. It is on the same side of the carburetor as the idle screw. This is a very important adjustment that greatly affects acceleration.

Idle Screw: A protruding brass screw located in the middle of the carburetor body facing the steering shaft. Turning the screw in raises the idle speed; turning it out lowers the idle speed.

5-1 CARBURETOR REMOVAL

Remove the air cleaner.
Disconnect the fuel line and auto-choke electric wire.
Unscrew the intake pipe mounting bolts at the carburetor then remove the carburetor.
NOTE: Turn fuel tap in off position

Loose the carburetor cap.
Remove the throttle valve from the carburetor.



Remove the throttle valve from the throttle cable.

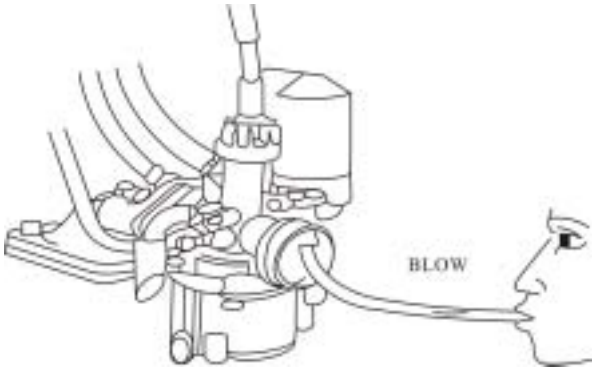
THROTTLE VALVE DISASSEMBLY
Remove the retainer and take out the jet needle clip from the throttle valve.

INSPECTION
Check the throttle valve and the jet needle surface of dirt, scratches or wear.

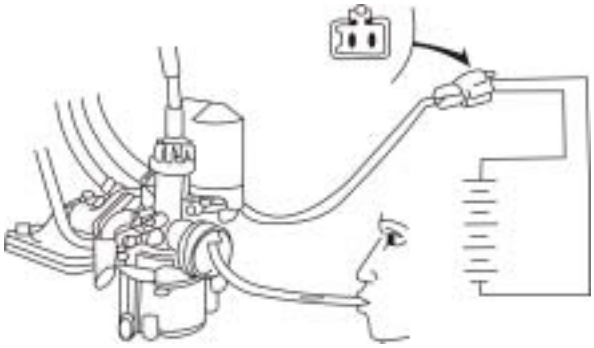
5-2 STARTER PLUNGER INSPECTION

Check the starter plunger wire for continuity.
STANDARE : UNDER 10

Remove the carburetor and let it cool down by nature for thirty minutes.
Check the current of air routs as show.
GOOD: CHECKLESS
NG: CHECKED



Connect a full charged battery to the starter plunger wore for five minutes.
Check the current of route as show.
GOOD: CHECKED
NG: CHECKLESS



5-3 FLOAT CHAMBER DISASSEMBLY

Remove the setting screws.
Remove the chamber cap.

Remove the float setting bolt.
Remove the float pin.
Remove the float.
Remove the float valve.

Remove the main jet, slow jet, needle seat & air screw.
Clean all the jet & all the hole by using high pressure air.

5-4 FUEL HEIGHT INSPECTION

Measure the height by using a gauge.
STANDARD: 18.5mm

5-5 CARBURETOR INSTALLATION

The installation sequence is essentially the reverse of remove.

Adjust the clearance of the throttle valve cable.
Adjust the air screw.

STANDARD: $1\frac{1}{2} \pm \frac{1}{2}$ round

Adjust the idle speed.

STANDARD: 1800±100rpm

5-6 REED VALVE

5-6-1 REED VALVE REMOVAL

Remove the carburetor.

Remove the intake pipe.

Remove the reed valve.

5-6-2 REED VALVE INSPECTION

Measure the height of reed valve stopper.

Check the flatness of reed valve.

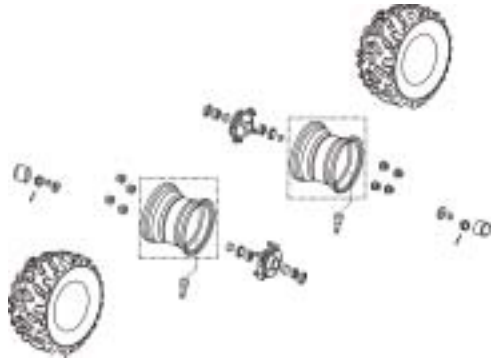
5-6-3 REED VALVE INSTALLATION

The installation sequence is essentially the reverse of removal.

VI.FRAME SYSTEM

6-1 FRONT WHEEL AND STEEDRING SYSTEM

6-1-1 DRAWING OF FRONT WHEELS AND STEERING SYSTEM PARTS



6-1-2 TROUBLESHOOTING

HARD STEERING →
- FAULTY TIRE
- STEERING SHAFT HOLDER TOO TIGHT
- INSUFFICIENT TIRE PRESSURE
- FAULTY STEERING SHAFT
- DAMAGED STEERING SHAFT BEARING

FRONT WHEEL WOBBLING →
- FAULTY TIRE
- WORN FRONT BRAKE DRUM BEARING
- BENT RIM
- AXLE NUT NOT TIGHTENED PROPERLY

BRAKE DRAG →
- INCORRECT BRAKE ADJUSTMENT
- STICEKING BRAKE CABLE

STEERS TO ONE SIDE →
- BENT TIE RODS
- WHEEL INSTALLED INCORRECTLY
- UNEQUAL TIRE PRESSURE
- BENT FRAME
- WORN SEING ARM PIVOT BUSHINGS

POOR BRAKE PERFORMANCE →
- BRAKE SHOES WORN
- WORN BRAKE DRUM
- BRAKE LINNGS OILY, GREASY OR DIRTY
- IMPROPER BRAKE ADJUSTMENT

FRONT SUSPENSION NOISE →
- LOOSE FRONT SUSPENSION FASTENERS
- BINDING SUSPENSION LINK

HARD SUSPENSION →
- FAULTY FRONT SWING ARM BUSHINGS
- IMPROPERLY INSTALLED FRONT SWING ARMS
- BENT FRONT SHOCK ABSORBER ROD

SOFT SUSPENSION →
- WEAK FRONT SHOCK ABSORBER SPRINGS
- WORN OR ADMAGED FRONT SWING ARMBUSHINGS

6-1-3 HANDLE BAR REMOVAL AND INSTALLATION

EMOVAL

Remove the handle cover.

Remove the throttle cable on the right level.

Remove the front brake cable. Please note that if you want to take the front brake cable apart, the gap of adjustable screw of brake needs to aim at the gap of right level.

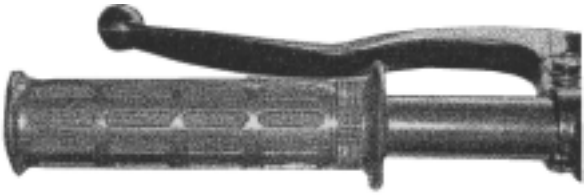
Loose the screw of right level and remove the right level to the fuel tank.

Remove the right grip.
Take right level apart from handle bar.

Remove the rear brake cable and link switch electric wire of rear brake light.

Remove the left handle switch and link electric wire.

Loose the screw of left level and remove left level to fuel tank.
Remove the left grip.



Remove the handle cover stay.
Remove the L/R handle cover holder.

Remove the handle bar.

INSTALLATION
Install ation is the reverse order of removal.

Please pay attention to following items when you assemble L/R level:

A. There are one point of orientation separately located on the left and the right of handle bar.
B. When you assemble left level, the gap of left level must aim at orientation of handle bar (as drawing B).
C. When you assemble right level, the gap of right level must aim at orientation of handle bar (as drawing C).

6-1-4 FRONT WHEEL

REMOVAL

Raise the front wheels off the ground by placing a block under the frame.
Remove the front wheel nuts, washers and wheels.

INSTALLATION
Install and tighten the four-wheel nuts
TORQUE:3.5-4.0kgf-m
Remember to put a cotter pin in the castle nut.

6-1-5 FRONT BRAKES

FRONT BRAKE INSPECTION

Remove the front wheel.
Remove the brake drum.
Measure the brake lining thickness.
The minimum limit: 1.5mm
If they are thinner than the minimum limit, replace the brake linings.

Measure the brake drum inner diameter.
The maximum limit : 86mm

Turn the inner ace of each bearing with the fingers.
The bearings should turn smoothly and quietly
If the race does not turn smoothly or quietly, remove and discard the bearings.

BRAKE PANEL REMOVEAL
Disconnect the brake cable from the brake arm.
Remove the brake panel from the knuckle.

Remove brake arm and cam.
Remove return spring.
Remove felt seal.

INSTALL BRAKE PANEL
Apply grease to the brake cam and anchor pin and install the cam it the brake panel.
Soak the felt seal in the engine oil and install the seal on the brake cam.

Install the brake arm on the cam by aligning the punch mark and the grove on the cam.
Tighten the brake arm bolt and nut.
TORQUE : 4.7Nm

Install the brake panel on the knuckle.
Connect the brake cable to the brake arm.
Install the brake arm cover.
Tighten the screws securely.
Position the brake shoes in their original location and install the brake shoe spring.
Install the brake drum and the front wheel.
Install the castle nut and cotter pin.

6-1-6 STEERING SYSTEM

REMOVAL OF KUNCKLE AND TIE-ROD

Remove the front wheels and brakes panel.
Remove the four self lock nuts from the tie-rod ball joints and take off the two tie-rods.

Take the rubber cap off the knuckle and remove the cotter pin on the knuckle.
Unscrew the castle nut and remove the knuckle.

TIE-ROD INSPECTION

Inspect the tie-rod for damage or bending.
Inspect the ball joint rubbers for damage, wear or deterioration.
Turn the ball joints with fingers, the ball joints should turn smoothly and quietly.

KNUCHLE INSPECTION
Inspect the knuckle for damage or cracks.
Measure the knuckle outer diameter.
Upper minimum limit: ϕ15.40mm
Lower minimum limit: ϕ16.90mm

KNUCKLE BUSHING INSPECTION
There are two bushings in the sleeve of the front swing arm, the upper and lower bushing.
Check the knuckle bushings for wear or damage.
Measure the inner diameter of the bushings.
Upper minimum limit: ϕ15.60mm
Lower minimum limit: ϕ17.10mm

STEERING SHAFT REMOVAL
Remove the handle bar and handle bar cover.
Remove the front side cover.
Unscrew the steering shaft fixing nut from the bottom of the shaft.
Pull steering shaft carefully.

SLEEVE INSPECTION
Remove the steering shaft.
Remove the sleeve from the shaft.
Inspect the sleeve for damage or wear, replace if necessary.
Measure the sleeve inner diameter.

STEERING SHAFT INSPECTION
Inspect the steering shaft for damage or cracks.
Measure the steering shaft outer diameter in the location of the sleeve.

STEER ING SHAFT BEARING INSPECTION
The bearing is on the front part of fame.
Turn the shaft bearing by hand.
The bearing should turn smoothly and quietly.
Also check the bearing outer race figment in the holder.
Replace the bearing if necessary.

INSTALLATION OF STEERING SHAFT
Install the steering shaft with the bushing.
Apply grease to the bushing.
Install the bushing holder and tighten the nuts.
TORQUE: 2.0-2.2kgf-m

Install the steering shaft nut and tighten it.
This nut is on the bottom side of the steering shaft.
TORQUE: 4.5-5.0kgf-m

INSTALLATION OF TIE-ROD

Install the ball joint with “L” mark on the steering shaft side.

Install the tie-rod with the mark on the wheel side.

Set the distance between the ball joints at 278mm

This is a temporary setting.

INSTALLATION OF KINGPIN

Use grease to the knuckle lower dust seal lips and install it.

Pump grease to the bushing and install the knuckle.

Tighten the knuckle nut, the setting torque is 3.0-4.0kgf-m

Fix the waterproof rubber cap.

Set the temporary distance 278mm between the ball joints.

Install the tie-rod and tighten the nuts.

The setting torque :3.5-4.0kgf-m

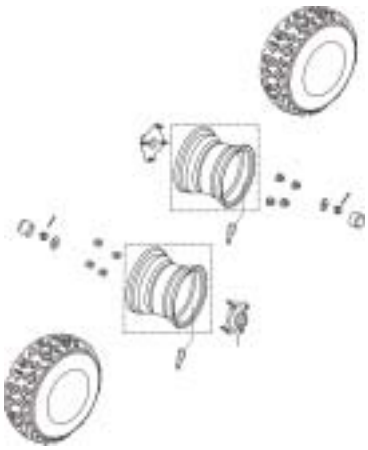
Install the front brake.

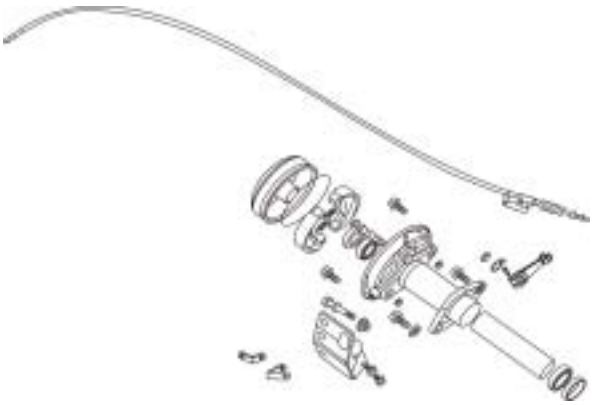
Install the front wheel.

Adjust the toe in by changing the distance between the ball joints on the tie rods.

6-2 REAR WHEELS

6-2-1 THE PARTS DRAWING OF REAR WHEEL ASSEMBLY





6-2-2 TROUBLESHOOTING

BAD BRAKE PERFORMANCE →

- **BRAKE SHOES ARE WORN**
- **BAD BRAKE ADJUSTMENT**
- **BRAKE LININGS ARE OILY, GREASY OR DIRTY**
- **BRAKE DRUMS ARE WORN**
- **BRAKE ARM INPROPERLY ENGAGED**

VIBRATION OR WOBBLE →

- **AXLE IS NOT TIGHTENED WELL**
- **BENT RIM**
- **AXLE BEARINGS ARE WORN**
- **FAULTY TIRES**
- **REAR AXLE BEARING HOLDER IS FAULTY**

BRAKE DRAG →

- **INCORRECT BRAKE ADJUSTMENT**
- **STICKING BRAKE CAM**
- **STICKING BRAKE CABLE**

6-2-3 REMOVE REAR WHEEL AND REAR BRAKE

Lift the rear wheels off the ground.
Release the cotter pin, axle nut and washer.
Release the wheel and wheel hub.

Remove the spacer tube.
Remove the brake dun cover.

Remove the axle collar and brake drum.

Check the brake lining thickness.
The minimum limit is 2.0mm

Check the brake drum for damage.
Replace if necessary.
Check the brake drum inner diameter.
The maximum limit is 80mm

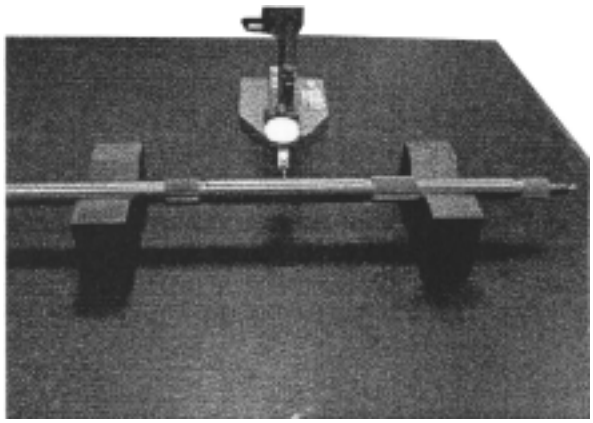
6-2-4 DRIVE MECHANISM REMOVAL AND INSPECTION

Remove the rear wheel and the rear brake
Remove the lower part of the drive chain cover.

Remove the chain retainer clip and master link.

Disassembly the driven sprocket, axle and sprocket collar.
Check the driven sprocket for damage or wear.

Position the rear axle in V-blocks and check the run out.
The run out limit is 0.5mm



Check the ease of rotation of the bearing by hand.
The bearings should turn smoothly and quietly.
Replace if necessary.

INSTALLATION
Add grease to the dust seal lips and install dust seals.
Assemble the rear axle and the driven sprocket.

Assemble the drive chain on the driven sprocket.
Install the master link and retaining clip.
Note the retainer clip direction (open end to back).
Install the complete drive chain cover.

6-2-5 REAR BRAKE AND WHEEL INSTALLATION

Install the brake panel
Add grease to the brake cam and anchor pin.
Install the brake arm spring and oil seal.

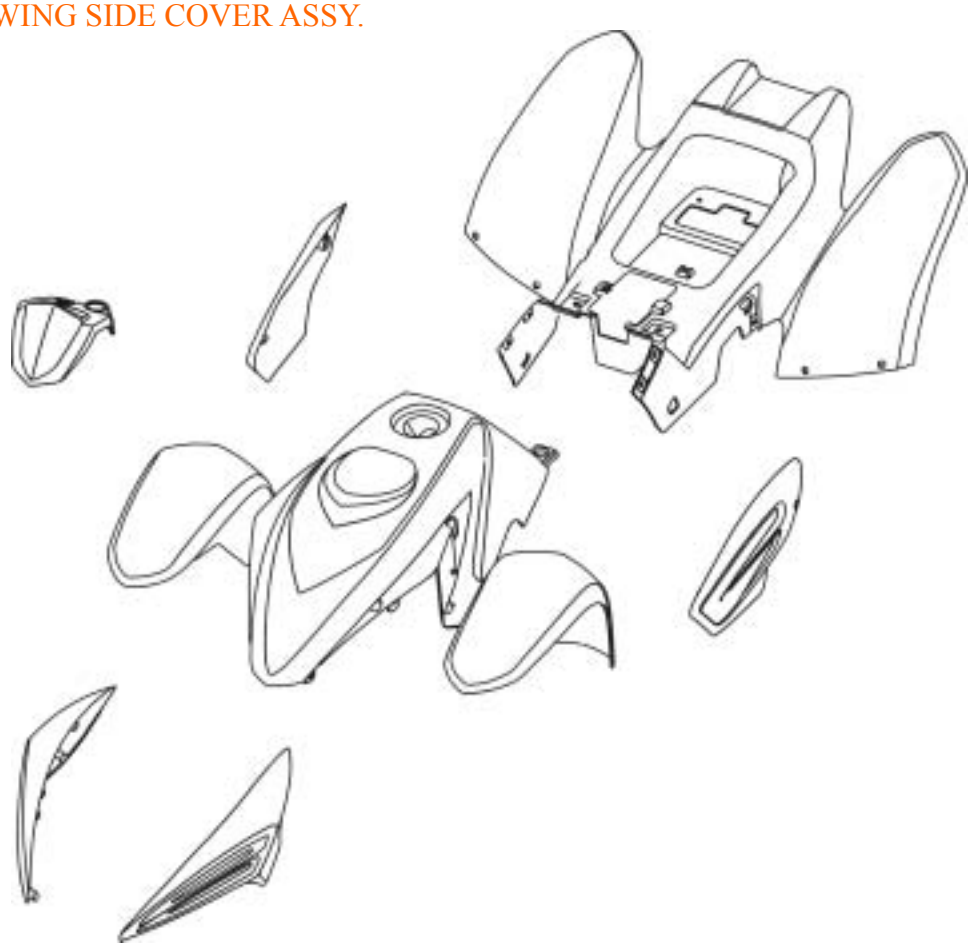
Assemble the brake arm aligning the punch marks on the cam and the arm.
Tighten the brake arm bolt and nut with 0.8-1.0kgf-m torque. Install the adjusters.

Install the brake shoes and springs.

Assemble the brake drum, axle collar and brake drum cover, Mount the wheel.
Tighten the rear axle nut with 4.5-5.0kgf-m
Install a new cotter pin.
Adjust free play of the rear brake.
Adjust chain slack.

6-3 FENDERS AND EXHAUST PIPE

6-3-1 DRAWING SIDE COVER ASSY.



6-3-2 COVER REMOVAL

Remove the seat and battery disconnect the main switch and winker Assy electric wire.

Remove the side cover 3 and 4.
Remove the foot well 1 and 2.

Remove the eight screws (two of the screws are inside the front cover connected with frame) which are fitted on front cover.

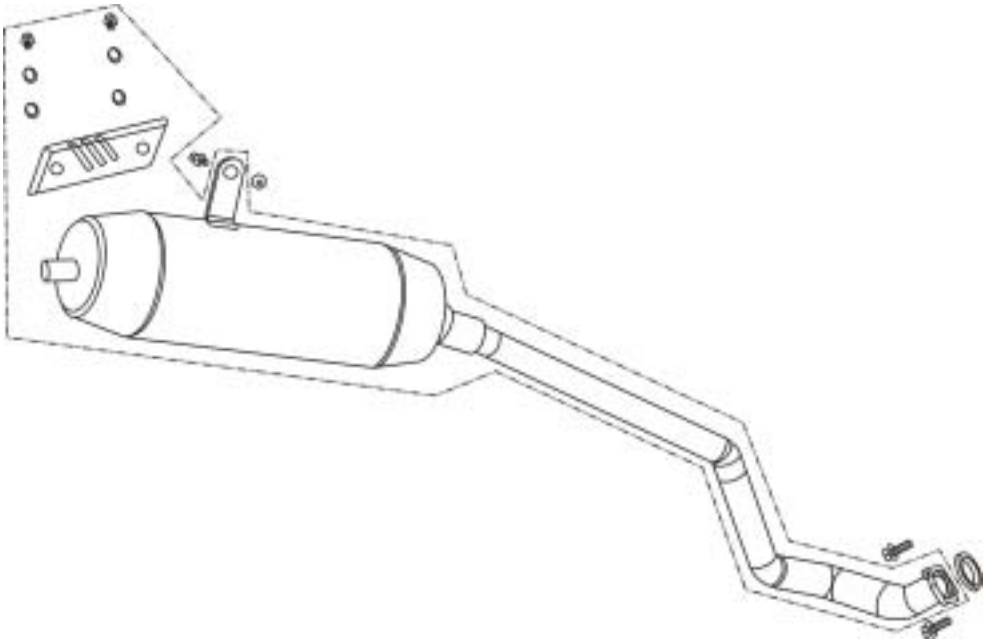
Remove the two screw which fitted on the rear cover.

Remove the rear cover.

If you only want to take the rear cover apart; please do followings steps.

1. Remove the seat and batter.
2. Remove the eight screws which fitted on the front cover.
3. Remove the two screws which fitted on the rear cover.
4. Remove the four screws which fitted on the foot well 1.2 and rear cover.
5. Push the front cover forward and up, you sill take the rear cover apart.

6-3-3 EXHAUST PIPE DRAWING



6-3-4 EXHAUST PIPE REMOVEAL

Do not service the exhaust pipe while it is hot.
Unscrew the bolts that fix the exhaust pipe with the engine.

Remove the exhaust pipe mounting bolts besides the muffler body.
Remove the exhaust pipe carefully.

6-3-5 EXHAUST PIPE INSTALLATION

Installation is the reverse order of removal.
TORQUE :Exhaust muffler bolts 2.5-3.0kgf-m
After installation, make sure that there are no exhaust leaks.

Ⅶ. ELECTRICAL SYSTEM

7-1 TROUBLESHOOTING

ENGINE STARTS & STALLS

- **IMPROPER IGNITION TIMING**
- **FAULTY SPARK PLUG**

NO SPARK AT PLUG

- **ENGEINE STOP SWITCH AT “OFF”**
- **FAULTY IGNITION COIL**
- **FAULTY GENERATOR**
- **FAULTY CDI UNIT**
- **POOR CONNECTOR CONTACET:**

  Between CDI and ignition coil

  Between alternator and CDI unit

  Between CDI and engine stop switch

  Between ignition coil and spark plug

  Between generator and CDI unit

ENGINE STARTS BUT RUNS POORLY

- **IGNITION PRIMARY CIRCUIT**

  Faulty generator

  Faulty CDI unit

  Faulty alternator exciter coil

  Loosened contact terminals

  Faulty ignition coil
- **IGNITION SECONDARY CIRCUIT**

  Faulty plug

  Loosened contact spark plug cable
- **IMPROPER IGNITION TIMING**

  Faulty generator

  Faulty CDI unit

CHARGING SYSTEM FAILURE

- **LOOSE, BROKEN OR SHORTED WIRE**
- **FAULTY ALTERNATOR**
- **FAULTY IGNITION SWITCH**

ENGINE INTERMITTENT POWER

- **LOOSE BATTERY CONNECTION**
- **LOOSE CHARGING SYSTEM CONNECTION**

STARTER MOTOR WILL NOT TURN

- **DEAD BATTERY**
- **FAULTY IGNITION SWITCH**
- **OLLSE OR DISCONNECTED WIRE**

STARTER MOTOR AND ENGINE TURN, BUT ENGINE DOES NOT START

- **FAULTY IGNITION SYSTEM**
- **ENGINE PROBLEMS**
- **FAULTY ENGINE STOP SWITCH**

7-2 BATTERY REMOVAL / INSTALLATION

BATTERY INSPECTION

Check the voltage of the battery.

FULL CHARGE:13.0-13.2V

UNDER CHARGE:12.3V

BATTERY REMOVAL

Remove the battery holder bolt nuts.

Disconnect the negative cable and then the position cable and remove the battery.

BATTERY INSTALLATION

Install the battery in the reverse order of removal.

After installing the battery, coat the terminals with clean grease.

BATTERY CHARGING

Connect charge position (+) cable to the battery positive termini.

Connect the charge negative (-) cable to the battery negative (-) terminal.

CHARGING CURRENT :

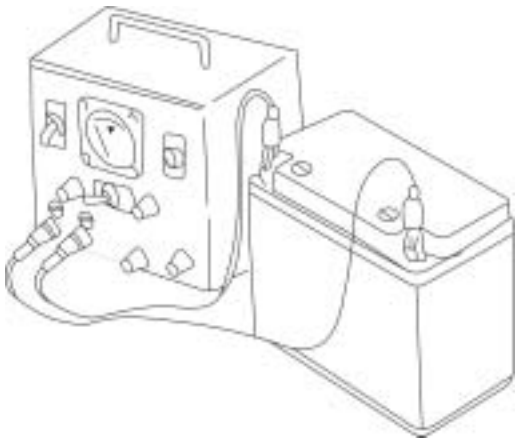
STANDARD:0.4A

SWIFTNESS:4A

CHARGING TIME:

STANDARD:5hrs

SWIFTNESS:30min



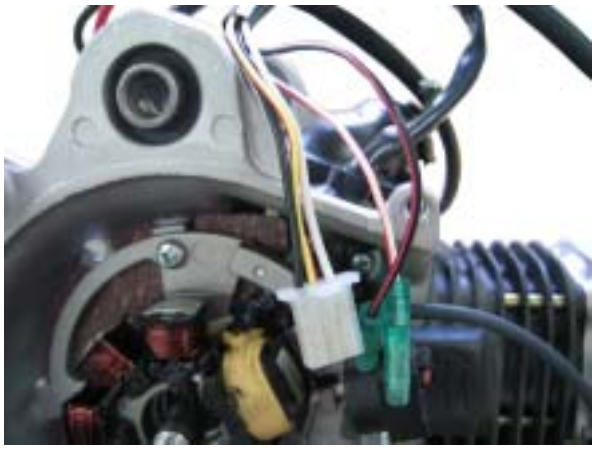
7-3 A.C.G. INSPECTION

EXCITER COIL INSPECTION

Disconnect the black / red wire of A.C.G.

Check the black / red and earth wire for continuity.

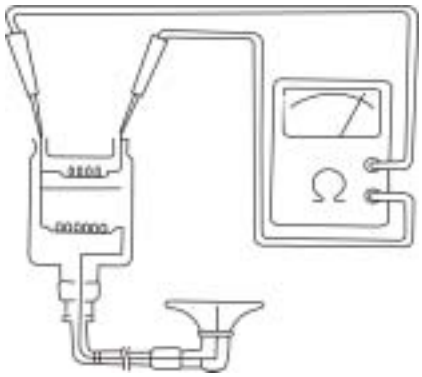
STANDARD : 300Ω-1KΩ (20℃)



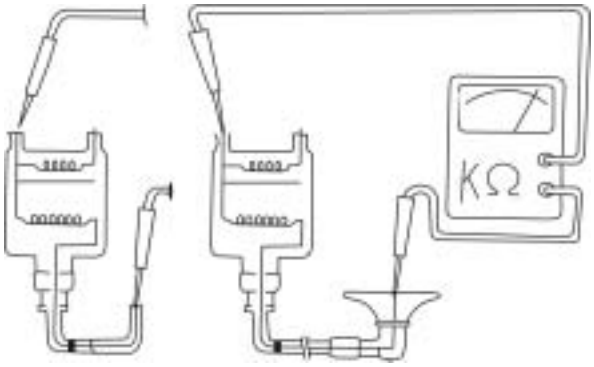
PLUSET COIL INSPECTION
Disconnect the blue / yellow wire of A.C.G.
Check the blue / yellow wire and green wire for continuity.
STANDARD:40Ω-300Ω (20℃)

7-4 IGNITION COIL INSPECTION

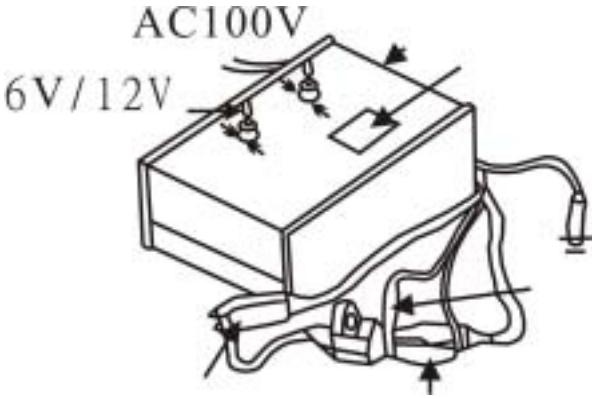
Check the primary coil for continuity.
Mark connections with an ohmmeter as shown.
The coil is normal if there is continuity.
STANDARD: 0.1Ω-1.0Ω (20℃)



Check the secondary coil for continuity.
The ignite coil is correct if there is continuity.
STANDARD:
With plug cap: 7Ω-12Ω
No plug cap: 3Ω-5Ω



Check the coil output on a ignition coil tester.
Set the tester to ignition test, dial out the electrodes and observe the spark gap.
GOOD: Continuous spark.
NG: Discontinuous spark
NOTE:
Follow the instructions supplied with the tester.



7-5 START MOROTR

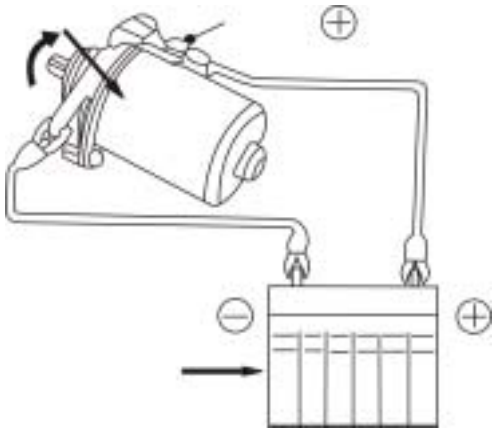
START MORTOR INSPECTION

Connect a battery (12V) to the motor.

Check the performance of the motor.

NOTE:

Use a fully charged battery.



7-6 START RELLEY INSPECTION

Connect a battery (12V) between (D) and (C) as show.

Check the continuity between the (A) pole (B) pole.

GOOD: continuity

NG: discontinuity

7-7 PROJECTOR LIGHT

When project light is broken, please loose the bolt (1) and check the filament in the bulb (2) is damage or not. If yes, please replace new bulb; if no damage on filament, please loosen bolt (3) and replace the whole project light.